

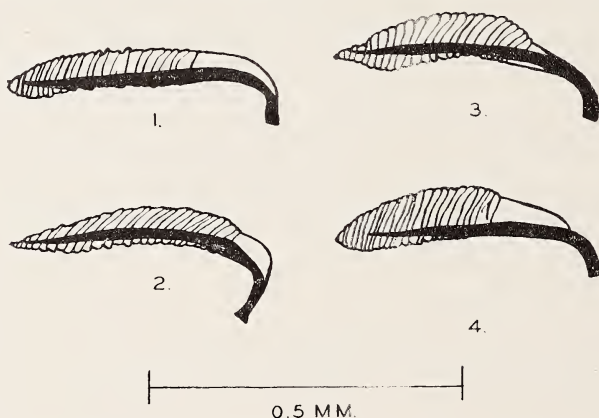
THE TAXONOMIC VALUE OF THE OVIPOSITOR IN  
THE NEW ENGLAND SPECIES OF THE GENUS  
*CORYTHUCHA* STÅL (HEMIPTERA: TINGIDAE)

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The purpose of this paper is to present evidence that the ovipositor of the New England species in the genus *Corythucha* Stål is of taxonomic value in the separation of the species. This work is based upon a study of thirteen species, of which over 450 whole mounts have been prepared and examined.

I. Procedure for the preparation of the ovipositor

To prepare the entire ovipositor for study the abdomen was first separated from the insect and placed in a



Figs. 1-4. Lateral view of valve one. Fig. 1. *C. pergandei*. Fig. 2. *C. marmorata*. Fig. 3. *C. cydoniae*. Fig. 4. *C. pruni*.

cell of a white porcelain spot-plate (Coors #000). Five percent sodium hypochlorite solution was used to clear

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the abdomen. Clearing was continued until the last few segments became transparent. Depending on the maturity of the insect, considerable variation in the time of clearing was encountered. A somewhat teneral (incompletely pigmented adult) female cleared sufficiently in 30 minutes whereas an older one required as much as three hours. The specimen was washed, stained with 5 percent acid fuchsin, dehydrated, and mounted ventral side up in permount on a microscope slide.

Preparation of the valves of the ovipositor requires ten minutes. Abdomens from insects previously stored in 70 percent alcohol, can be run up to 95 percent alcohol, then put into absolute alcohol, and clearing agent. With a pair of *minuten nadeln* mounted in needle holders, the valves are dissected and mounted on a microscope slide.

## II. Morphology of the abdomen and ovipositor

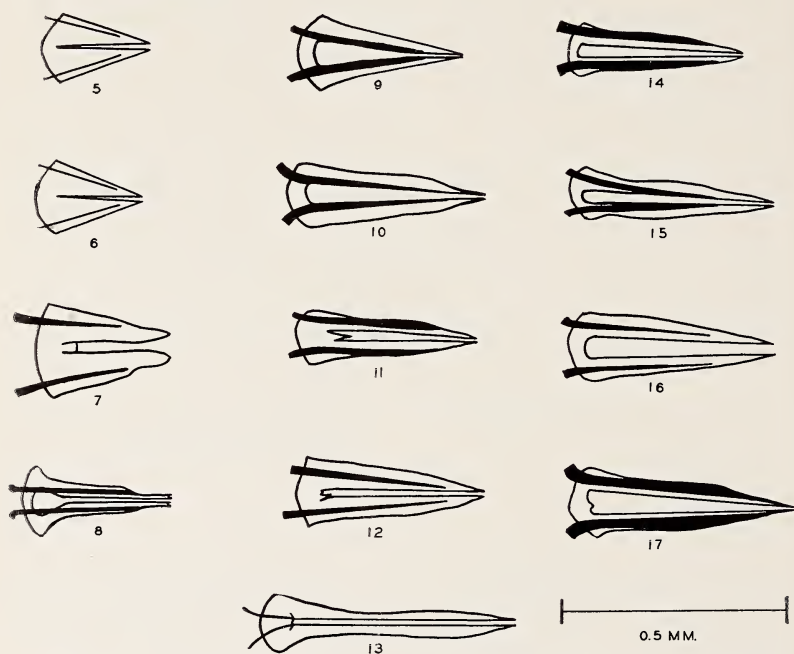
The abdomen of the female consists of nine segments with a much reduced tenth segment, represented by a pair of lateral plates and a single tergite. Snodgrass<sup>1</sup> showed that in *Anasa tristis* DeGeer the sternum of the first segment is absent; the first ventral plate of the abdomen is therefore the second sternite. This is also true of *Corythucha*. The dorsal aspect of the abdomen is flat but the ventral side is convex. Sternite VII is modified along its posterior medial border to form a single lobe, the subgenital plate. Sternites VIII, IX, and X are paired and modified to form the ovipositor.

In a typical case exhibited by *Corythucha heidemanni* Drake, the ovipositor comprises two fifths of the entire length of the abdomen, the pregenital segments making up the remaining three fifths (figure 18). The shape of the abdomen from the ventral aspect is elliptical. The posterior segments progressively diminish in size so that the terminal part of the abdomen tapers more or less to a rounded point.

From the ventral view the upper pair of valves is valve one. These are symmetrical and possess a score or more ridges over the entire surface except the dorsal side

<sup>1</sup> 1933. Morphology of the Insect Abdomen. Part II. The genital ducts and the ovipositor. Smithsonian Misc. Coll., 89(8): 1-148.

and the anterior end of the valve. A fold of tissue connects these two valves along their medial borders. On each valve is inserted a ramus which is a prolongation of the first valvifer, the basal plate or lobe which supports the valves of the ovipositor.



Figs. 5-17. The second valves in ventral aspect. Fig. 5. *C. mollicula*. Fig. 6. *C. arcuata*. Fig. 7. *C. cydoniae*. Fig. 8. *C. marmorata*. Fig. 9. *C. pruni*. Fig. 10. *C. juglandis*. Fig. 11. *C. ulmi*. Fig. 12. *C. caryae*. Fig. 13. *C. ciliata*. Fig. 14. *C. pergandei*. Fig. 15. *C. coryli*. Fig. 16. *C. heidemanni*. Fig. 17. *C. pallipes*.

The first valvifer is rectangular, with a lobed posterior medial margin. The dorsal surface of the first valves bears two parallel ridges; between these is a groove into which fits a ridge on the ventral surface of the corresponding second valve.

The second valves are above or dorsal to the first valves. They are united with each other at their proximal ends by a common base. Valve two is elongate and sharply pointed distally and each valve is connected to the cor-

responding first valve by a slide and groove arrangement.

The second valvifer is an oblong plate lying lateral and somewhat dorsal to the first valve. Its proximal end fits snugly posterior to the ramus of the first valve. At the distal end of the second valvifer is a much reduced third valve.

In all cases valve one is measured from the most proximal part of its ramus to the distal end of the valve. Valve two is measured from the common base to the distal end.

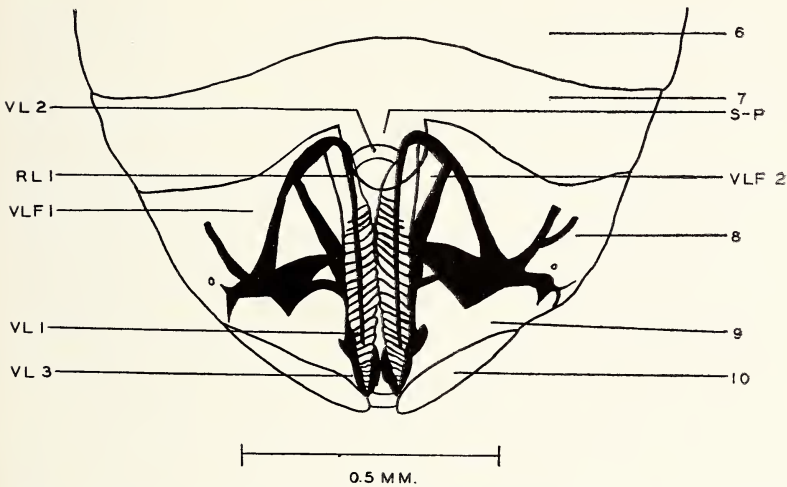


Fig. 18. Ovipositor of *Corythucha heidemanni* Drake in ventral aspect. (VL 1) valve one, (VL 2) valve two, (VL 3) valve three, (Vlf 1) valvifer one, (Vlf 2) valvifer two, (S-P) subgenital plate, (Rl 1) ramus of valve one.

### *C. arcuata* (Say)

The length of valve one varies from 0.29-0.33 mm. and its average length is 0.31 mm. Valve two varies in length from 0.25-0.28 mm. with an average length of 0.26 mm. The shape of valve two is triangular from the ventral aspect (fig. 6). On the basis of the shape of valve two, this species can readily be differentiated from all other species studied with the exception of *C. mollicula*. The second valves of these two species are identical. The subgenital plate is circular.

*C. caryae* Bailey<sup>2</sup>

The average length of the first valve is 0.50 mm. and it varies from 0.46-0.53 mm. Valve two has a ridge present on the posterior margin of the common base connecting the two valves. Variation in the length of these valves ranges from 0.40-0.44 mm. and the average length is 0.43 mm. Valve two is elongate. The subgenital plate is subcircular and is approximately twice as large as that of *C. arcuata*.

*C. ciliata* (Say)

This species exhibits the longest valves of any species studied. By comparing the length of each valve of this species with those of other species, *C. ciliata* can readily be separated from all others. The length of valve one ranges from 0.53-0.61 mm. and its average length is 0.58 mm. The configuration of the ventral aspect of valve two affords a second excellent method of separating this species from all others (fig. 13). Its shape is extremely elongate and narrow compared to other species. The average length of valve two is 0.53 mm. and it varies from 0.50-0.56 mm. The subgenital plate is elliptical.

*C. coryli* Osborn and Drake

The average length of valve one is 0.46 mm. with variation occurring from 0.43-0.48 mm. Valve two is elongate with its anterior lateral angles pointed (fig. 15). Lengths of the latter valve vary from 0.42-0.43 mm. with an average length of 0.43 mm. The subgenital plate is elliptical.

*C. cydoniae* (Fitch)

The length of valve one varies from 0.36-0.43 mm. and its average length is 0.40 mm. The diagnostic character separating this species from all others is the convex shape of valve one (fig. 3). Valve two varies from 0.31-0.35 mm. and its average length is 0.33 mm. The shape of valve two is very diagnostic since it is unique (fig. 7). The subgenital plate is almost square with the posterior margin rounded.

*C. heidemanni* Drake

The length of valve one in this species varies from

<sup>2</sup> 1951. The Tingoidea of New England and their Biology. Ent. Amer., 31 n.s.: 1-140.

0.49-0.52 mm. and its average length is 0.51 mm. Valve two has an average length of 0.45 mm. and its range of variation is 0.44-0.47 mm. The shape of this valve is elongate and its anterior lateral margins are rounded (fig. 16). The subgenital plate is elliptical.

*C. juglandis* (Fitch)

The length of valve one varies from 0.47-0.53 mm. and its average length is 0.49 mm. Valve two ranges from 0.42-0.47 mm. and its average length is 0.45 mm. The latter valve is elongate and its anterior lateral margins are pointed. The subgenital plate is elliptical.

*C. marmorata* (Uhler)

On the average, valve one measures 0.39 mm. and its range of variation extends from 0.36-0.41 mm. The shape of this valve in lateral view is unique (fig. 2). Valve two presents an interesting configuration which by itself is highly diagnostic. The anterior halves of these valves together form a shape not unlike that of a mushroom (fig. 8). The average length of the second valves is 0.32 mm. and it varies from 0.30-0.32 mm. The subgenital plate is much broader than long.

*C. mollicula* Osborn and Drake

Valve one has an average length of 0.31 mm. and its range of variation is 0.29-0.34 mm. The shapes of valves one and two are identical to those of *C. arcuata* (fig. 5). Valve two measures on the average 0.26 mm. and its variation ranges from 0.23-0.28 mm. The subgenital plate is circular.

*C. pallipes* Parshley

Valve one varies in length from 0.52-0.54 mm. and its average length is 0.54 mm. Valve two varies from 0.47-0.52 mm. and the average measurement is 0.49 mm. The subgenital plate is elliptical.

*C. pergandei* Heidemann

Valve one varies from 0.44-0.50 mm. with an average length of 0.47 mm. The shape of the distal end of this valve is abruptly pointed (fig. 1). Valve two is elongate and tapers posteriorly (fig. 14). Its measurements vary from 0.37-0.45 mm. and its average length is 0.41 mm. The subgenital plate is elliptical.

*C. pruni* Osborn and Drake

The average length of valve one is 0.42 mm. with variation between 0.40-0.45 mm. Valve two varies from 0.34-0.41 mm. and its average length is 0.38 mm. Valve two is triangular with a convex base. The subgenital plate is circular.

*C. ulmi* Osborn and Drake

Valve one varies in length from 0.47-0.44 mm. and its average length is 0.46 mm. Valve two varies in length from 0.32-0.41 mm. and its average length is 0.37 mm. The shape of valve two is elongate and tapers at its distal end. The subgenital plate is elliptical.

## III. Characters of taxonomic value

The features of taxonomic value in separating the New England species of *Corythucha* are: the shape of the ventral aspect of a pair of second valves, the length of valve two, the shape of the lateral aspect of valve one, the length of valve one, and the shape of the subgenital plate.

On the basis of the above characters, ten species can be easily separated. The remaining three species which could not be separated in this way are: *C. juglandis*, *C. heidemanni*, and *C. coryli*.

	1 VI		2 VI	
<i>C. arcuata</i>	0.31 mm.	(10)	0.26 mm.	(4)
<i>C. mollicula</i>	0.31	(13)	0.26	(9)
<i>C. marmorata</i>	0.39	(12)	0.32	(9)
<i>C. cydoniae</i>	0.40	(13)	0.33	(5)
<i>C. pruni</i>	0.42	(9)	0.38	(3)
<i>C. coryli</i>	0.46	(7)	0.43	(6)
<i>C. ulmi</i>	0.46	(6)	0.43	(6)
<i>C. pergandei</i>	0.47	(17)	0.41	(4)
<i>C. juglandis</i>	0.49	(7)	0.45	(4)
<i>C. caryae</i>	0.50	(11)	0.43	(6)
<i>C. heidemanni</i>	0.51	(13)	0.45	(6)
<i>C. pallipes</i>	0.54	(9)	0.49	(5)
<i>C. ciliata</i>	0.58	(11)	0.53	(6)

Table 1. Average comparative lengths of valves one and two. The numbers in parenthesis indicate the actual number of measurements determined for each case.

IV. A key to the New England species of the genus *Corythucha* Stål based upon characters of the ovipositor.

1. Second valvulae broad, the length of either valve 2 never more than two and one-half times the width of their common base (fig. 5-9) ..... 2
 

Second valvulae elongate, the length of either valve 2 at least 3 times the width of their common base (figs. 10-17) ..... 5
2. Common base of the second valves mushroom shaped (fig. 8) ..... *C. marmorata*  
Not as above ..... 3
3. Base of second valves markedly broad, 0.31-0.35 mm. long, subgenital plate elliptical ..... *C. cydoniae*  
Base of second valves not so broad, subgenital plate circular ..... 4
4. Second valves larger, 0.34-0.41 mm. long; first valves larger, 0.40-0.45 mm. long ..... *C. pruni*  
Second valves smaller, 0.23-0.28 mm. long; first valves smaller, 0.29-0.34 mm. long . . . *C. arcuata*, *C. mollicula*
5. Valve 2 extremely elongate; its length at least four times the width of its common base; valve 1 long, 0.53-0.61 mm. .... *C. ciliata*  
Valve 2 never more than four times longer than its common base ..... 6
6. Subgenital plate circular ..... *C. caryae*  
Subgenital plate elliptical ..... 7
7. Distal end of valve 1 abruptly pointed .... *C. pergandei*  
Not as above ..... 8
8. Posterior margin of common base of valve 2 with a median projection, valve 2 longer, 0.52-0.54 mm. .... *C. pallipes*  
Posterior margin of common base of valve 2 with a median ridge, valve 2 shorter, 0.32-0.41 mm. . . *C. ulmi*

V. Conclusion

On the basis of the characters of the female genital



segments and their appendages, ten of the New England species of *Corythucha* were separated. These were: *C. marmorata*, *C. cydoniae*, *C. pruni*, *C. arcuata*, *C. mollicula*, *C. ciliata*, *C. caryae*, *C. pergandei*, *C. pallipes*, and *C. ulmi*. The remaining species could not be separated: *C. heidemanni*, *C. juglandis*, and *C. coryli*.

COMPOSITION OF THE ANT TRIBE TYPHLOMYRMICINI. — In 1911, Emery (Gen. Ins. 118: 32) raised a subtribe of his tribe Ectatommini to include the genera *Typhlomyrmex* Mayr, *Prionopelta* Mayr and *Rhopalopone* Emery, and named this subtribe Typhlomyrmicini. It has already been proposed on morphological grounds that *Prionopelta* be removed to tribe Amblyoponini and *Rhopalopone* remain in tribe Ectatommini, while *Typhlomyrmex* has been seen as the sole group representing an isolated line (Brown, 1950, Wasmann Jour. Biol., San Francisco, 8: 243-244.) The tribal name Typhlomyrmicini is hereby placed in use to include the Neotropical genus *Typhlomyrmex*. Tribal distinction is considered to be complete.

The male specimen without head, doubtfully referred by me in 1950 (*loc. cit.*) to *Prionopelta*, is now definitely recognized as a *Typhlomyrmex* of unknown species. It appears characteristic of *Typhlomyrmex* males that vein Mf1 arises basad of *cu-a*. Other characters of the genus and tribe will be brought out in a forthcoming key to the ponerine genera.

Examination of a cotype ("Zig-zag, Venezuela") of Forel's *Prionopelta marthae* (1909, Deutsch. ent. Zeitschr., p. 240, worker) in the Museum of Comparative Zoology shows that this species must be removed from *Prionopelta* and placed as a **new synonym** of *Typhlomyrmex rogenhoferi* Mayr (1862, Verh. zool.-bot. Ges. Wien 12: 737, worker; 1887, Ibid. 37: 538, ♀ ♂). Comparison was made with workers of *T. rogenhoferi* determined by Mann and Wheeler from Pará, Brazil (Mann *leg.*), and these proved closely similar. The *marthae* type differs distinctly from types of *T. pusillus* Emery and *T. robustus* Emery in the Museum of Comparative Zoology. — WILLIAM L. BROWN, JR., Museum of Comparative Zoology.